Ser. No. 10/040,500 filed 12/28/2001
Long et al – GAU 2192 (Dao)
Submission in Support of RCE

AMENDMENTS TO THE CLAIMS

1.   (Previously Presented)   A computer-implemented method for establishing a

structure of a data item within a computer system, where said data item is an instance of a

first class and inherits attributes and methods from said first class, the method comprising

the steps of:

creating a category object that is an instance of a category class, wherein said category

       class has one or more attributes; and

associating said data item with said category object without associating said category

       object with all other instances of said first class thereby causing said data item to

       be associated with a structure that includes storage for values for said one or more

       attributes of said category class.

2.   (Original)   The method for Claim 1 further comprising the computer-implemented

steps of:

receiving data that is designated for a particular attribute of said one or more attributes;

determining whether said data conforms to rules associated with said particular attribute;

       and

if said data conforms to said rules

       storing said data as a value into said particular attribute.

3.   (Previously Presented)   The method for Claim 2 wherein the steps of receiving,

determining, and storing are performed by a method in said category class.

Ser. No. 10/040,500 filed 12/28/2001
Long et al – GAU 2192 (Dao)
Submission in Support of RCE

4.   (Original)   The method for Claim 2 wherein said rules are data type rules associated

with a data type of said particular attribute.

5.   (Original)   The method for Claim 2 wherein said rules are software rules.

6.   (Currently Amended) The method for Claim 1 further comprising the <u>computer-</u>

<u>implemented</u> step of:

storing within a database, objects that define said data item and said category object.

7.   (Original)   The method for Claim 1 further comprising the computer-implemented

step of:

maintaining an object relational mapping system that indicates a correlation between said

        data item and data stored in a relational database.

8.   (Original)   The method for Claim 1 wherein said category class is a user defined

subclass of a parent category class.

9.   (Previously Presented)   The method for Claim 1 wherein the step of associating

said data item with said category object further includes the computer-implemented step

of:

establishing a pointer from said category object to said data item.

10.   (Previously Presented)   The method for Claim 1 wherein the step of associating

said data item with said category object further includes the computer-implemented step

of:

Ser. No. 10/040,500 filed 12/28/2001
Long et al – GAU 2192 (Dao)
Submission in Support of RCE

maintaining a table that includes an entry that indicates that said data item is associated

with said category.

11.   (Previously Presented)   The method for Claim 10 wherein the step of maintaining a

table further includes the computer-implemented step of:

maintaining said entry to include a key that identifies said category object and a pointer

to said category object.

12.   (Currently Amended) The method of Claim 10 ~~for~~ <u>wherein</u> the step of maintaining a

table further includes the computer-implemented step of:

maintaining said table externally to said data item.

13.   (Previously Presented)   The method of Claim 10 wherein the step of maintaining a

table further includes the computer-implemented step of:

maintaining said table internally to said data item.

14.   (Previously Presented)   The method for Claim 1 wherein the step of associating

said data item with said category object further includes the computer-implemented step

of:

storing into said data item a hash table;

locating an entry in said hash table for said category object based on data associated with

said category object;

locating a pointer to said category object in said entry; and

following said pointer to locate said category object.

Ser. No. 10/040,500 filed 12/28/2001
Long et al – GAU 2192 (Dao)
Submission in Support of RCE

15. (Original) The method for Claim 14 further comprising the computer-implemented

steps of:

receiving data that is designated as a key for locating said entry in said hash table;

determining whether said data conforms to rules associated with said key; and

if said data conforms to said rules

using said data as said key to locate said entry.

16. (Previously Presented) The method for Claim 1 wherein the step of creating a

category object further includes the computer-implemented step of:

maintaining a table that includes an entry that contains a particular attribute of said one or

more attributes.

17. (Previously Presented) The method for Claim 16 wherein the step of maintaining a

table further includes the computer-implemented step of:

maintaining said entry to include a key that identifies said particular attribute.

18. (Previously Presented) The method of Claim 16 wherein the step of maintaining a

table further includes the computer-implemented step of:

maintaining said table externally to said category object.

19. (Previously Presented) The method of Claim 16 wherein the step of maintaining a

table further includes the computer-implemented step of:

maintaining said table internally to said category object.

Ser. No. 10/040,500 filed 12/28/2001
Long et al – GAU 2192 (Dao)
Submission in Support of RCE

20.   (Previously Presented)   The method for Claim 1 wherein the step of creating a

category object further includes the computer-implemented steps of:

storing into said category object a hash table; and

locating an entry in said hash table for a particular attribute of said one or more attributes.

21.   (Original)   The method for Claim 20 further comprising the computer-implemented

steps of:

receiving data that is designated as a key for locating said entry in said hash table;

determining whether said data conforms to rules associated with said key; and

if said data conforms to said rules

    using said data as said key to locate said entry.

22.   (Original)   The method for Claim 1 further comprising the computer-implemented

step of:

associating said category object with a second data item that is an instance of a second

    class, without associating said category object with all other instances of said

    second class wherein said first class is a different class from said second class.

23.   (Previously Presented)   The method for Claim 1 wherein said category class is a

first file type and said category object is a first file of said first file type in a file system;

wherein said first class is a second file type and said data item is a second file of said

    second file type in a file system; and

wherein the step of associating includes associating said second file with said first file

    without associating said first file with all other instances of said second file type

Ser. No. 10/040,500 filed 12/28/2001
Long et al – GAU 2192 (Dao)
Submission in Support of RCE

thereby causing said second file to be associated with said structure in said file

system.

24.   (Previously Presented)   A computer-implemented method for establishing a

structure of a data item within a computer system, where the data item is an instance of a

class and inherits attributes and methods from said class, the method comprising the steps

of:

creating a first category object that is an instance of a first category class, wherein said

        first category class has one or more attributes;

creating a second category object that is an instance of a second category class, wherein

        said second category class has one or more attributes and is a different class than

        the first category class;

wherein the first category class and the second category class are external to the class

        lineage of the class of which the data item is an instance; and

associating said data item with said first category object and with said second category

        object thereby causing said data item to be associated with a structure that

        includes storage for values for said one or more attributes of said first category

        class and for said one or more attributes of said second category class.

25.   (Original)   The method for Claim 24 further comprising the computer-implemented

steps of:

receiving data that is designated for a particular attribute of said one or more attributes of

        said first category class;

Ser. No. 10/040,500 filed 12/28/2001
Long et al – GAU 2192 (Dao)
Submission in Support of RCE

determining whether said data conforms to rules associated with said particular attribute;

and

if said data conforms to said rules

storing said data as a value into said particular attribute.

26.   (Previously Presented)   The method for Claim 25 wherein the steps of receiving,

determining, and storing are performed by a method in said first category class.

27.   (Original)   The method for Claim 25 wherein said rules are data type rules associated

with a data type of said particular attribute.

28.   (Original)   The method for Claim 25 wherein said rules are software rules.

29.   (Currently Amended) The method for Claim 24 further comprising the <u>computer-</u>

<u>implemented</u> step of:

storing within a database, objects that define said data item and said first category object.

30.   (Original)   The method for Claim 24 further comprising the computer-implemented

step of:

maintaining an object relational mapping system that indicates a correlation between said

data item and data stored in a relational database.

31.   (Original)   The method for Claim 24 wherein said first category class is a user

defined subclass of a parent category class.

Ser. No. 10/040,500 filed 12/28/2001
Long et al – GAU 2192 (Dao)
Submission in Support of RCE

32.   (Previously Presented)   The method for Claim 24 wherein the step of associating

said data item with said first category object further includes the computer-implemented

step of:

establishing a pointer from said first category object to said data item.

33.   (Previously Presented)   The method for Claim 24 wherein the step of associating

said data item with said first category object further includes the computer-implemented

step of:

maintaining a table that includes an entry that indicates that said data item is associated

        with said first category.

34.   (Previously Presented)   The method for Claim 33 wherein the step of maintaining a

table further includes the computer-implemented step of:

maintaining said entry to include a key that identifies said first category object and a

        pointer to said first category object.

35.   (Previously Presented)   The method of Claim 33 wherein the step of maintaining a

table further includes the computer-implemented step of:

maintaining said table externally to said data item.

36.   (Previously Presented)   The method of Claim 33 wherein the step of maintaining a

table further includes the computer-implemented step of:

maintaining said table internally to said data item.

Ser. No. 10/040,500 filed 12/28/2001
Long et al – GAU 2192 (Dao)
Submission in Support of RCE

37.   (Previously Presented)   The method for Claim 24 wherein the step of associating

said data item with said first category object further includes the computer-implemented

step of:

storing into said data item a hash table;

locating an entry in said hash table for said first category object based on data associated

      with said first category object;

locating a pointer to said first category object in said entry; and

following said pointer to locate said first category object.

38.   (Original)   The method for Claim 37 further comprising the computer-implemented

steps of:

receiving data that is designated as a key for locating said entry in said hash table;

determining whether said data conforms to rules associated with said key; and

if said data conforms to said rules

      using said data as said key to locate said entry.

39.   (Previously Presented)   The method for Claim 24 wherein the step of creating a

first category object further includes the computer-implemented step of:

maintaining a table that includes an entry that contains a particular attribute of said one or

      more attributes of said first category class.

40.   (Previously Presented)   The method for Claim 39 wherein the step of maintaining a

table further includes the computer-implemented step of:

maintaining said entry to include a key that identifies said particular attribute.

Ser. No. 10/040,500 filed 12/28/2001
Long et al – GAU 2192 (Dao)
Submission in Support of RCE

41.   (Previously Presented)   The method of Claim 39 wherein the step of maintaining a

table further includes the computer-implemented step of:

maintaining said table externally to said category object.

42.   (Previously Presented)   The method of Claim 39 wherein the step of maintaining a

table further includes the computer-implemented step of:

maintaining said table internally to said category object.

43.   (Previously Presented)   The method for Claim 24 wherein the step of creating a

first category object further includes the computer-implemented steps of:

storing into said first category object a hash table; and

locating an entry in said hash table for a particular attribute of said one or more attributes

        of said first category class.

44.   (Original)   The method for Claim 43 further comprising the computer-implemented

steps of:

receiving data that is designated as a key for locating said entry in said hash table;

determining whether said data conforms to rules associated with said key; and

if said data conforms to said rules

        using said data as said key to locate said entry.

45.   (Original)   The method for Claim 24 wherein said first category class is a first file

type and said first category object is a first file of said first file type in a file system;

Ser. No. 10/040,500 filed 12/28/2001
Long et al – GAU 2192 (Dao)
Submission in Support of RCE

wherein said second category class is a second file type and said second category object

    is a second file of said second file type in said file system;

wherein said class is a third file type and said data item is a third file of said third file

    type in said file system; and

wherein the step of associating includes associating said third file with said first file and

    said second file thereby causing said third file to be associated with said structure

    in said file system that includes storage for values for said one or more attributes

    of said first file type and for said one or more attributes of said second file type.

46-47. (Not Entered)

48.   (New) A computer-readable storage medium storing one or more sequences of

instructions for establishing a structure of a data item within a computer system, wherein

said data item is an instance of a first class and inherits attributes and methods from said

first class, wherein the one or more sequences of instructions when executed by one or

more processors cause performance of the steps of:

creating a category object that is an instance of a category class, wherein said category

    class has one or more attributes; and

associating said data item with said category object without associating said category

    object with all other instances of said first class thereby causing said data item to

    be associated with a structure that includes storage for values for said one or more

    attributes of said category class.

Ser. No. 10/040,500 filed 12/28/2001
Long et al – GAU 2192 (Dao)
Submission in Support of RCE

49.   (New) The computer-readable storage medium of Claim 48, wherein the one or more

sequences of instructions further comprise instructions which, when executed by the one

or more processors, cause the performance of the steps of:

receiving data that is designated for a particular attribute of said one or more attributes;

determining whether said data conforms to rules associated with said particular attribute;

> and

if said data conforms to said rules

> storing said data as a value into said particular attribute.

50.   (New) The computer-readable storage medium of Claim 49, wherein the instructions that

cause the performance of the steps of receiving, determining, and storing are included in

instructions for performing a method in said category class.

51.   (New) The computer-readable storage medium of Claim 48, wherein the one or more

sequences of instructions further comprise instructions which, when executed by the one

or more processors, cause the performance of the step of:

storing within a database, objects that define said data item and said category object.

52.   (New) The computer-readable storage medium of Claim 48, wherein the one or more

sequences of instructions further comprise instructions which, when executed by the one

or more processors, cause the performance of the step of:

maintaining an object relational mapping system that indicates a correlation between said

> data item and data stored in a relational database.

Ser. No. 10/040,500 filed 12/28/2001
Long et al – GAU 2192 (Dao)
Submission in Support of RCE

53.   (New) The computer-readable storage medium of Claim 48, wherein said category class

is a user defined subclass of a parent category class.

54.   (New) The computer-readable storage medium of Claim 48, wherein the instructions that

cause the performance of the step of associating said data item with said category object

further comprise instructions which, when executed by the one or more processors, cause

the performance of the step of:

establishing a pointer from said category object to said data item.

55.   (New) The computer-readable storage medium of Claim 48, wherein the instructions that

cause the performance of the step of associating said data item with said category object

further comprise instructions which, when executed by the one or more processors, cause

the performance of the step of:

maintaining a table that includes an entry that indicates that said data item is associated

with said category.

56.   (New) The computer-readable storage medium of Claim 48, wherein the instructions that

cause the performance of the step of associating said data item with said category object

further comprise instructions which, when executed by the one or more processors, cause

the performance of the steps of:

storing into said data item a hash table;

locating an entry in said hash table for said category object based on data associated with

said category object;

locating a pointer to said category object in said entry; and

Ser. No. 10/040,500 filed 12/28/2001
Long et al – GAU 2192 (Dao)
Submission in Support of RCE

following said pointer to locate said category object.

57.   (New) The computer-readable storage medium of Claim 48, wherein the instructions that

cause the performance of the step of creating the category object further comprise

instructions which, when executed by the one or more processors, cause the performance

of the step of:

maintaining a table that includes an entry that contains a particular attribute of said one or

    more attributes.

58.   (New) The computer-readable storage medium of Claim 48, wherein the instructions that

cause the performance of the step of creating the category object further comprise

instructions which, when executed by the one or more processors, cause the performance

of the steps of:

storing into said category object a hash table; and

locating an entry in said hash table for a particular attribute of said one or more attributes.

59.   (New) The computer-readable storage medium of Claim 48, wherein:

said category class is a first file type and said category object is a first file of said first file

    type in a file system;

wherein said first class is a second file type and said data item is a second file of said

    second file type in a file system; and

wherein the instructions that cause the performance of the step of associating further

    comprise instructions which, when executed by the one or more processors, cause

    the performance of the step of associating said second file with said first file

Ser. No. 10/040,500 filed 12/28/2001
Long et al – GAU 2192 (Dao)
Submission in Support of RCE

without associating said first file with all other instances of said second file type

thereby causing said second file to be associated with said structure in said file

system.

60.   (New) A computer-readable storage medium storing one or more sequences of

instructions for establishing a structure of a data item within a computer system, wherein

the data item is an instance of a class and inherits attributes and methods from said class,

wherein the one or more sequences of instructions when executed by one or more

processors cause performance of the steps of:

creating a first category object that is an instance of a first category class, wherein said

first category class has one or more attributes;

creating a second category object that is an instance of a second category class, wherein

said second category class has one or more attributes and is a different class than

the first category class;

wherein the first category class and the second category class are external to the class

lineage of the class of which the data item is an instance; and

associating said data item with said first category object and with said second category

object thereby causing said data item to be associated with a structure that

includes storage for values for said one or more attributes of said first category

class and for said one or more attributes of said second category class.

61.   (New) The computer-readable storage medium of Claim 60, wherein the one or more

sequences of instructions further comprise instructions which, when executed by the one

or more processors, cause the performance of the steps of:

Ser. No. 10/040,500 filed 12/28/2001
Long et al – GAU 2192 (Dao)
Submission in Support of RCE

receiving data that is designated for a particular attribute of said one or more attributes of

said first category class;

determining whether said data conforms to rules associated with said particular attribute;

and

if said data conforms to said rules

storing said data as a value into said particular attribute.

62.   (New) The computer-readable storage medium of Claim 61, wherein the instructions that

cause the performance of the steps of receiving, determining, and storing are included in

instructions for performing a method in said first category class.

63.   (New) The computer-readable storage medium of Claim 60, wherein the one or more

sequences of instructions further comprise instructions which, when executed by the one

or more processors, cause the performance of the step of:

storing within a database, objects that define said data item and said first category object.

64.   (New) The computer-readable storage medium of Claim 60, wherein the one or more

sequences of instructions further comprise instructions which, when executed by the one

or more processors, cause the performance of the step of:

maintaining an object relational mapping system that indicates a correlation between said

data item and data stored in a relational database.

65.   (New) The computer-readable storage medium of Claim 60, wherein said first category

class is a user defined subclass of a parent category class.

Ser. No. 10/040,500 filed 12/28/2001
Long et al – GAU 2192 (Dao)
Submission in Support of RCE

66.   (New) The computer-readable storage medium of Claim 60, wherein the instructions that

cause the performance of the step of associating said data item with said first category

object further comprise instructions which, when executed by the one or more processors,

cause the performance of the step of:

establishing a pointer from said first category object to said data item.

67.   (New) The computer-readable storage medium of Claim 60, wherein the instructions that

cause the performance of the step of associating said data item with said first category

object further comprise instructions which, when executed by the one or more processors,

cause the performance of the step of:

maintaining a table that includes an entry that indicates that said data item is associated

with said first category.

68.   (New) The computer-readable storage medium of Claim 60, wherein the instructions that

cause the performance of the step of associating said data item with said first category

object further comprise instructions which, when executed by the one or more processors,

cause the performance of the step of:

storing into said data item a hash table;

locating an entry in said hash table for said first category object based on data associated

with said first category object;

locating a pointer to said first category object in said entry; and

following said pointer to locate said first category object.

Ser. No. 10/040,500 filed 12/28/2001
Long et al – GAU 2192 (Dao)
Submission in Support of RCE

69.   (New) The computer-readable storage medium of Claim 60, wherein the instructions that

cause the performance of the step of creating the first category object further comprise

instructions which, when executed by the one or more processors, cause the performance

of the step of:

maintaining a table that includes an entry that contains a particular attribute of said one or

    more attributes of said first category class.

70.   (New) The computer-readable storage medium of Claim 60, wherein the instructions that

cause the performance of the step of creating the first category object further comprise

instructions which, when executed by the one or more processors, cause the performance

of the steps of:

storing into said first category object a hash table; and

locating an entry in said hash table for a particular attribute of said one or more attributes

    of said first category class.

71.   (New) The computer-readable storage medium of Claim 60, wherein:

said first category class is a first file type and said first category object is a first file of

    said first file type in a file system;

wherein said second category class is a second file type and said second category object

    is a second file of said second file type in said file system;

wherein said class is a third file type and said data item is a third file of said third file

    type in said file system; and

wherein the instructions that cause the performance of the step of associating further

    comprise instructions which, when executed by the one or more processors, cause

Ser. No. 10/040,500 filed 12/28/2001
Long et al – GAU 2192 (Dao)
Submission in Support of RCE

the performance of the step of associating said third file with said first file and

said second file thereby causing said third file to be associated with said structure

in said file system that includes storage for values for said one or more attributes

of said first file type and for said one or more attributes of said second file type.